ABSTRACT OF THE DISCLOSURE

A method and apparatus for measuring a hole depth in a composite-material workpiece machined by a orbital cutting tool, including the steps of: applying a low-level electric potential to an electrically insulated cutting tool having a cutting head with radial and axial cutting edges and with a predetermined axial length; determining a first zero reference position as the cutting tool initially contacts a first surface of the workpiece and closes an electric circuit through the grounded workpiece; and detecting a second reference position when the cutting head penetrates an opposite, second surface of the workpiece. The finished hole depth is determined by deducting the predetermined axial length of the cutting head from the total length of axial advancement from the first zero reference position to the second reference position. The orbital machining apparatus includes ceramic bearings electrically insulating the spindle and the cutting tool from surrounding components of the apparatus.